

Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs, Education and Research EAER State Secretariat for Education, Research and Innovation SERI Swiss Space Office



Mission : JUICE (JUpiter ICy moons Explorer) 24/03/2023

| Overview | ESA's Jupiter Icy Moons Explorer, JUICE, is the first large-class mission in ESA's Cosmic Vision 2015-2025 programme. Planned for launch in April 2023 and arrival at Jupiter in July 2031, it will spend at least three years making detailed observations of the giant gaseous planet Jupiter and three of its largest moons, Ganymede, Callisto and Europa. Juice is an ESA-led mission with scientific and technological contributions from 13 Member States, including Switzerland. It also includes collaboration with other space agencies beyond Europe (ISA, JAXA, NASA). It carries a suite of 10 unique, state-of-the-art science instruments and one experiment. For the interactive ESA JUICE launch, please see: <u>https://esamultimedia.esa.int/docs/science/Juice-LaunchKit.pdf</u> | | |
|--------------------|---|--|--|
| Main Milestones/ | From the time of launch, the JUICE mission will take about 8 years to reach Jupiter and its system of moons, performing several flybys | | |
| Payload objectives | of Earth and of Venus. The primary mission to Jupiter will then last another four years. | | |
| | The JUICE mission consists of a large satellite that has been specially equipped for the environment of Jupiter. This includes special radiation shields to protect the satellite's electronics from the strong particle radiation around Jupiter, sophisticated temperature management against the extreme temperature differences, as well as a certain autonomy of control due to the large distances. | | |
| | JUICE will determine the characteristics of liquid-water oceans below the icy surfaces of the moons. This will lead to an understanding of the possible sources and cycling of chemical and thermal energy. It will also allow an investigation of the evolution and chemical composition of the surfaces and of the subsurface oceans, and enable an evaluation of the processes that have affected Jupiter's satellites and their environments through time. | | |
| Scheduled Launch | 13 April 2023, from the European Spaceport in Kourou, French Guiana, on an Ariane 5 launcher. | | |



Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra Federal Department of Economic Affairs, Education and Research EAER State Secretariat for Education, Research and Innovation SERI Swiss Space Office

Swiss Confederation

| Swiss Contributions to JUICE – The Satellite | The JUICE satellite was built by Thales Alenia Space a Swiss industrial contributions come from Beyond Gr cameras), SixSQ, APCO (Mechanical Ground Support EGSE). The development and construction of the sat Instrument | as prime contractor. avity CH (structures), Micro C Equipment - MGSE) and Cler cellite was funded through the Swiss Actors | ameras & Space Exploration SA (monitoring nessy (Electrical Ground Support Equipment e ESA Science Programme. Contact |
|--|---|--|--|
| Swiss Contributions | 1. PEP (Particle Environment Package) | | |
| to JUICE - The | A plasma package with sensors to characterise the plasma | University of Bern, | Peter Wurz peter.wurz@unibe.ch |
| Scientific | environment in the Jovian system. PEP will measure | EMPA, | Brigit Bucher <u>brigit.bucher@unibe.ch</u> / |
| Instruments | density and fluxes of positive and negative ions, electrons, | Paul Scherrer Institute | sophie krummenacher@unibe.ch |
| | neutral atoms in the energy range from <0.001 eV to >1 | HSLU. | <u>sopnie.krunnienacher@unibe.ch</u> |
| | MeV with full angular coverage. The composition of the | Swanlsotopen AG | Wojtek Hajdas wojtek.hajdas@psi.ch / |
| | moons' exospheres will be measured with a resolving | | Benjamin Senn <u>benjamin.senn@psi.ch</u> |
| | power of more than 1000. | | |
| | 2. GALA (GAnymede Laser Altimeter) | | |
| | A laser altimeter for studying the tidal deformation of | University of Bern, | Nicolas Thomas nicolas.thomas@unibe.ch |
| | Ganymede and the morphology and topography of the | Thales | Brigit Bucher <u>brigit.bucher@unibe.ch</u> / |
| | surfaces of the icy moons. GALA will have a 40 m spot size | Alenia Space Switzerland, | Sophie Krummenacher |
| | and 0.1 m vertical resolution at 200 km. | Syderal SA, | sopnie.krummenacher@unibe.ch |
| | | Spacetek rechnology AG | |
| | 3. SWI (Sub-millimeter Wave Instrument) | | |
| | A sub-millimeter wave instrument to investigate the | University of Bern, | Axel Murk axel.murk@unibe.ch |
| | temperature structure, composition and dynamics of | Micos Engineering GmbH | Brigit Bucher <u>brigit.bucher@unibe.ch</u> / |
| | Jupiter's stratosphere and troposphere, and the | | Sophie Krummenacher |
| | exospheres and surfaces of the icy moons. SWI is a | | sophie.krummenacher@unibe.ch |



Schweizerische Eidgenossenschaft Confédération suisse Confederazione Svizzera Confederaziun svizra Federal Department of Economic Affairs, Education and Research EAER State Secretariat for Education, Research and Innovation SERI Swiss Space Office

Swiss Confederation

| | heterodyne spectrometer using a 29 cm antenna and | | | |
|-----------------|--|--|--|--|
| | working in two spectral ranges 1080-1275 GHz and 530- | | | |
| | 601 GHz with spectral resolving power of ~107. | | | |
| | | | | |
| Swiss financial | The contribution from Switzerland to the 3 scientific instruments (PEP, GALA, SWI) were financed through ESA's PRODEX programme | | | |
| contributions | PROgramme de Développement d'EXpériences) for 21.5 M€. Via PRODEX, national contributions for science missions can be | | | |
| | developed and built by project teams from research and industry. This transfer of knowledge and technology between science and | | | |
| | industry ultimately also gives Switzerland a structural competitive advantage as a business location – and enables technologies. | | | |
| | processes and products to flow into other markets and thus generate added value for the economy. Switzerland is an important | | | |
| | programme participant in PRODEX, making it possible for Swiss actors to bring their expertise to state-of-the-art projects and develop | | | |
| | new competences. | | | |
| | | | | |
| | In addition, PSI contributed to a radiation monitor for the ILIICE mission. This was funded through the FSA Science Programme | | | |
| | | | | |
| Useful links | 1. ESA's JUICE media kit in French, German, Italian and English: ESA - Juice Jaunch kit | | | |
| | 2. Follow the launch live: ESA - ESA Web TV | | | |
| | 3. UniBE information and launch event: www.unibe.ch/juicelaunch | | | |
| | 4. PSI: Paul Scherrer Institute (PSI) | | | |
| | 5. Media accreditation will be published at ESA - Press Releases for: | | | |
| | - the Online press briefing in English to be held on 6 April 2023 | | | |
| | - the launch media event at the European Space Operations Centre in Darmstadt, Germany, on 13 April 2023 | | | |
| | 6 _ PPODEX Programme in Switzerland: Programme de développement d'expériences scientifiques (PPODEX) (admin.ch) | | | |
| | 6. PRODEX Programme in Switzenand. <u>Programme de developpement à experiences scientinques (FRODEX) (admin.on</u> | | | |
| | | | | |